

THE HISTORY AND CONSTRUCTION OF THE W. B. & A. RAILROAD BRIDGE OVER
THE ROBERT CRAIN HIGHWAY, WEST OF MILLERSVILLE, MARYLAND.

Thesis prepared by

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Summary

The site of the bridge was a wilderness except for the single track railroad, which was originally built by the B. & O. Railroad as a branch line in 1838, until the Robert Crain Highway was built in 1923. The bridge site was ideal for the construction of an underpass. A small stream runs thru a box culvert which was built diagonally under the original fill at an elevation sufficiently below the track to permit the road to pass between the culvert and the girders of the bridge. This gave perfect drainage conditions and practically eliminated any earthwork beside tunneling thru the fill.

The W. B. & A. bought this line when the company was organized in 1909. They also bought the Baltimore & Annapolis Short Line in 1921; and as an appurtenance of the Bladens Street Station, they obtained a 60 ton turntable with a span of 54'4". When the need came for the bridge at Millersville in 1923 it was decided to use the turntable which was not needed at the station. The turntable was put on flat cars and carried to Millersville where it was placed at night to prevent interruption to traffic. Later the bridge crew put in abutments and two double frame bents to help support the girders, since they were originally designed as cantilevers rather than beams. The road was then tunneled thru the fill.

The cost including the abutments and all other items totaled \$4,739.33 and was born entirely by the railroad company. The girders are in good condition after having served 50 years because they are made of wrought iron and have been well maintained. The timber piers were originally treated and are practically free from decay because they rest on concrete foundations elevated above the ground. The bridge was investigated by the B & O and was found to be sufficiently strong to carry engines having a bridge rating of not more than 220.

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HISTORY

A history of this bridge should include several separate histories each bearing on the subject but beginning at such times that a continuous history would be inadequate. For this reason each history will be given separately and brought up to the point where it connects with the others.

A. HISTORY OF THE ANNAPOLIS - ANNAPOLIS JUNCTION BRANCH LINE

This line is the line on which the bridge at Millersville is located. Its history begins in 1838 when the Baltimore and Ohio Railroad Company built it to connect Annapolis to its main line running between Washington and Baltimore. It is rumored that this branch was the second track laid in the United States. Though I doubt this statement, it is true that it was one of the first few. Where the bridge is now located, there was nothing but a wilderness of woods and thick underbrush. According to old inhabitants, this section remained a wilderness until the Crain Highway was built in 1923. The track at this point is on a long radius curve on a high fill crossing a little stream which is now dry. Under the fill is a long diagonal box culvert 4' x 3' in section. This culvert was made of large stones and slabs. Judging from the type of construction and the musty condition of these stones, I believe that this fill is original location and the culvert was built at that time. This line was run by the B & O for a long time. It was also operated as the Annapolis and Elkridge Railroad. The W. B. & A. bought it in 1907, electrified it, and have operated it ever since.

B. HISTORY OF THE WASHINGTON BALTIMORE AND ANNAPOLIS RAILROAD COMPANY

Between 1907 and 1911 the W. B. & A. was organized. It was first capitalized as the Baltimore Terminal Company but was soon recapitalized under the present name. They laid a modern double track between Washington

and Baltimore and bought the branch line mentioned previously as a connector with Annapolis. The intersection of these lines is the central terminus and for this reason the field shops and offices are also located there. This station is known as the Naval Academy Junction. In 1921 the Short Line was bought and became part of the system. The total amount of track owned by the company is equivalent to 130 miles of single track. The tracks are all laid with 80 pound rails and are on a gravel ballast. The present equipment is very modern and includes an automatic block system installed by the Union Switch and Signal Company. They also own 148 cars including freight, passenger, and service cars. The revenue is obtained principally from the passenger service between these three cities and their suburbs. All equipment is particularly well maintained and is thoroughly modern. The branch between Annapolis Junction and Naval Academy Junction is particularly important because it furnishes transportation facilities to Fort Meade, which is a very important army camp. During the war it was located where it is because of the good transportation facilities, and it is important that these facilities be maintained for military reasons even if the revenue is not sufficient to warrant it otherwise.

C. HISTORY OF THE BRIDGE GIRDERS

In 1886 the Baltimore and Annapolis Short Line was organized. The only track was for a steam line connecting these two cities. The Annapolis terminal was the Bladens Street Station where a turntable was placed to reverse the locomotives. This turntable was to become the bridge at Millersville. Tho there is no record of the construction of this turntable, the girders were probable fabricated in some steel shop or by a bridge company. and brought together rigidly fastened by the cross bracing. This table was designed as a balanced cantilever for turning 60 ton engines. It was lowered into a cylindrical pit lined with brick. It was supported by a centering mechanism which turned on a pivot, and at both ends by end carriages which were

mounted on wheels. Later this line was sold to the Maryland Electric Railway Company. In 1921 this line was bought by the W. B. & A. and became the North Shore Branch tho it is still called the Short Line unofficially.

D. HISTORY OF THE ROBERT CRAIN HIGHWAY

In 1922 the state legislature appropriated \$1,000,000 for the construction of the Baltimore - Southern Maryland trunk line. The legislation was due principally to the efforts of Robert Crain and soon after the construction the highway was officially designated by his name. The first contract was signed September 19, 1922 for a stretch of road running 4.5 miles south from Bensfield. This section of the highway included the portion thru Millersville. Construction began immediately and was completed the following year on August 23, 1923. The complete length of the highway is 31.5 miles extending from Baltimore thru Upper Marlboro to the southern terminus near Mattawoman, most of the route being on relocation. It has since been extended for most of the proposed route. It is essential for such a highway to be complete to serve any benefits commensurate with the cost.

E. HISTORY OF THE BRIDGE SINCE 1922

When the Crain Highway was planned, the W. B. & A. decided to build a bridge to eliminate a crossing at grade, all expenses to be born entirely by the railroad company. All of the men who were questioned were of the opinion that the bridge was placed in the spring of 1922. This, however, is incorrect because the Crain Highway was still just a proposal at that time, and also records show that it was built the following spring. A work order of the company dated April 2, 1923 was found in the records at Naval Academy Junction. It estimated the cost at \$4000.00 and the time of construction at 6 months. A record of Job #2195 was found in the auditors office in Baltimore listing the expenses for the bridge construction which totaled \$4739.33 dated between April 9, 1923 and September 30, 1923. The old turntable at the Bladens Street

Station, which was bought in 1921 as one of the appurtenances of that station, was of no use to the company because all of the electric cars are reversible. Its scrap value would have been about \$250.00 and the cost of the steel girders for a standard bridge would be about \$1000.00. It was decided to save the difference by salvaging the old turntable for the crossing at Millersville. The turntable was brought without alteration to the girders on two flat cars to Millersville where it was placed at night so as not to interrupt the normal schedule. This was probably done about April 15, 1923 and during the following months the abutments and piers were placed and the earth excavated from under the bridge during normal working hours. During the work the bridge was underpinned in some way so as not to interfere with the normal traffic. The actual construction details will be given later in this paper.

In March 1931 the B & O made an investigation of the bridges on the branch line between Fort Meade Junction and Annapolis. They wanted to run a few special trains to Annapolis and it was necessary to determine the strength and condition of these bridges. They found that all of the bridges could carry engines having a bridge rating of 220 or less, however, it was recommended that a speed of less than 10 miles per hour be maintained over certain of these bridges including bridge #4 at Millersville. This ruled out P-1C type engines but permitted P-1AA type engines which have been run over the line several times since the investigation. The records show also that the girders, piers, and abutments were all in good condition. They also show that a new 6"x 8" timber outer guard rail had been placed in addition to the inner guard of steel rails which were placed when the bridge was constructed. The accompanying blue print was made for the investigation and was obtained from the bridge engineer's offices of the B & O in Baltimore.

CONSTRUCTION

A. LOCATION AND CONDITIONS AT THE SITE

The bridge is located in Anne Arundel county just west of Millersville station on the W. B. & A. line and over the Robert Crain Highway. The accompanying map shows the location. The bridge is a deck turntable 54' 4" span supported by double frame bents on concrete foundations and by bank abutments of concrete. The bridge is banked very slightly being on a long radius curve. The clearance is 14' 6"

The site has ideal conditions of drainage and earthwork for the construction of an underpass. A small stream which is one of the tributaries of the Severn River crosses the road and the railway line at the bridge location. This would at first seem to complicate the regular drainage features which are always a special problem in underpasses. However, this stream is at such an elevation that it is very advantageous. The accompanying sketch shows the local conditions of the site and the solution to the drainage problem. The original culvert to carry the stream under the fill was sufficiently long and on such an angle as to permit it to carry the stream under the road also. Actually the road was tunneled between the bridge and the culvert. The railway ditches drain to the road ditches. The road ditches drain on one side directly into the stream and on the other side into a sump and under the road into the stream. The fill being high permitted a minimum of earthworks. The road simply followed the profile of the earth requiring only the removal of the fill.

The accompanying print showing a plan of the crossing was obtained from the survey offices of the State Roads Commission. It was the proposed location of the road. No record was obtainable which showed the actual location which was considerably different from the proposed location. This seems to cast suspicion on the other records but there is sufficient evidence to show that this location is not the actual location. The profile which is recorded

with this plan could not possibly be near the present location. The crossing is at no such skew as is indicated. There is no evidence of there having been a previous road which if it actually had existed would have run directly up the stream bed. Probably the advantages of the present location caused them to change the planned crossing entirely.

B. CONSTRUCTION

About the 8th of April, 1923 the work on the moving of the turntable began. The girders were disconnected from the centering and end carriages. The two girders weighing about 25,000 pounds were jacked up with screw jacks and tie cribbings. When sufficiently high, a track was laid under the girders and two flat cars were run under them. The girders, unaltered, and still rigidly connected with the crossbracing, were then hauled to Millersville. Previously a tie cribbing had been built on the side of the track, and the structure was slid onto it by skids. Two days later, after the last scheduled train had passed at 12:30 at night, a carpenters gang and a track gang were on hand for the placing. The track was broken and a pit was dug in the roadbed where the bridge was to be placed. In the pit two tie cribs were built and the girders were skidded onto them. Then as jacks lowered the bridge into position the cribs were removed. When the bridge was finally in position, the track was connected ready for service the next morning. The work was completed by 5:00 o'clock. Since the turntable was designed as a cantilever, it was not suitable for simple end supports. 12' x 12' timber mud sills were placed on concrete foundations to help support the middle of the girders. These were constructed by the bridge crew on a normal working schedule. Pits were dug at the location of these piers while the girders remained supported on the remaining earth. In the same manner the abutments were built. When these were finished the earth was tunneled away between the abutments. Part of this work must have been done in close coöperation with

the highway construction, since both were being constructed at the same time. The highway was finished on August 23 and probably the bridge was finished at the same time tho payments were being made later according to the auditors records. The blue print and photographs which accompany this report show the bridge as it now exists.

At present the bridge is in good condition. The timber piers were originally treated, and being off the ground on elevated concrete foundations they are subject to very little deterioration. The original turntable was of wrought iron and has been well maintained; so tho it has been in use for 50 years, it is still very servicable. There should be no reason for replacing this structure with a standard type for a long time, unless it is decided to widen the road. However, this is very unlikely considering the traffic on the highway.

BIBLIOGRAPHY

Most of the information obtained was by interviews with the following men at the places indicated:

Mr. Frank - Assistant Engineer of Maintenance and Ways, W. B. & A. Academy Junction.

Mr. Weinland - Engineer of Maintenance and Ways, W. B. & A. Baltimore.

Mr. Colgan - Auditor, W. B. & A. Baltimore.

Mr. Willett - Track Supervisor, W. B. & A.; section foreman of the track gang during the construction. Academy Junction.

Mr. Basil - Motorman, W. B. & A.; workman in carpenters gang during the construction. Academy Junction.

Mr. Jim Hopkins - Station Foreman, W. B. & A.; workman during the removal of the turntable. Bladens Street Station.

Mr. Shure - Chief of Survey Office of State Roads Commission. Baltimore.

Mr. Hopkins - Bridge Engineer, State Roads Commission. Baltimore.

Mr. Stuart - Secretary of the State Roads Commission. Baltimore.

Mr. Sloan - Bridge Engineer, B. & O. Baltimore.

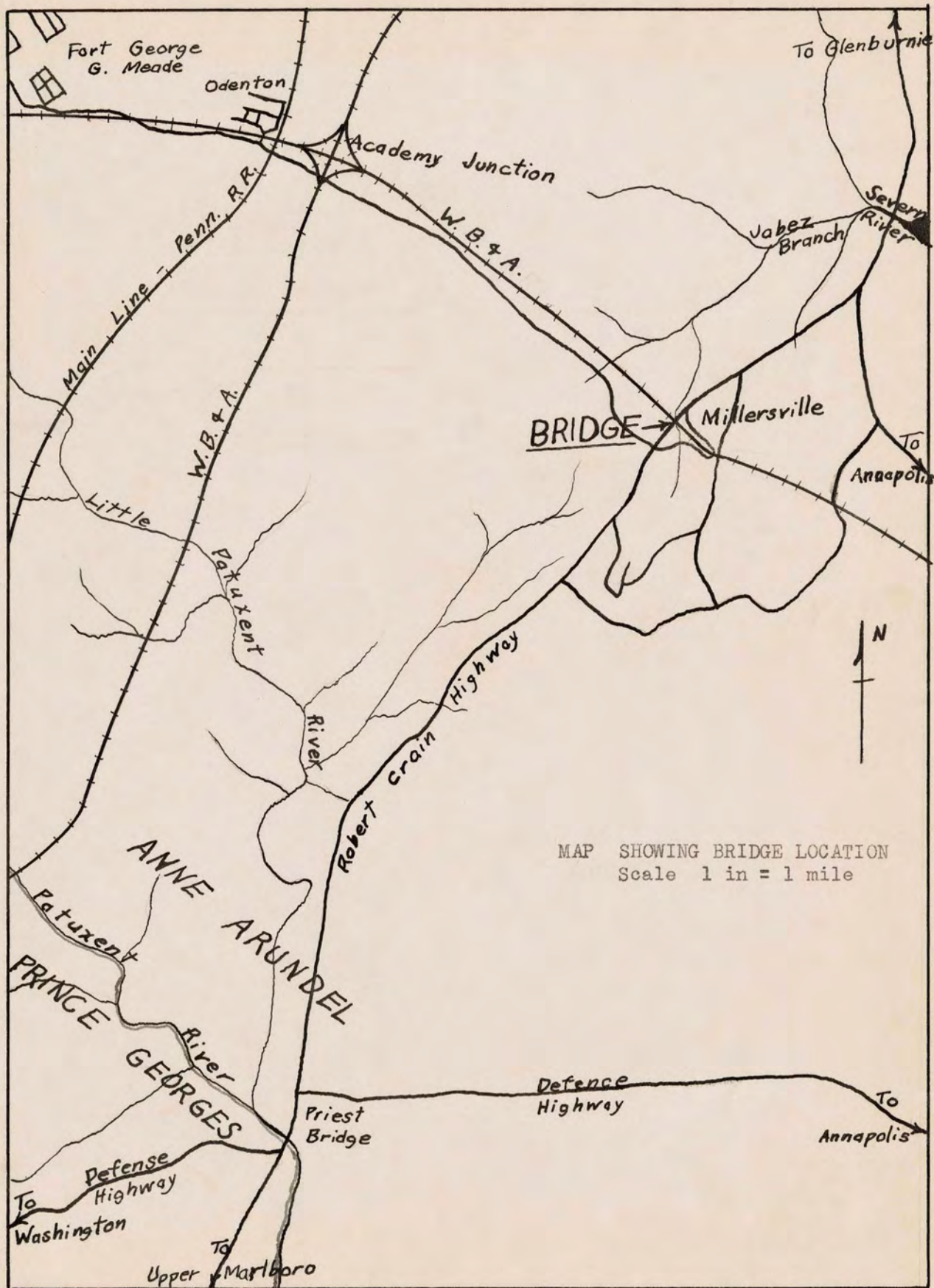
Almost all written records of this bridge have been lost, but the following sources of information were of some value:

W. B. & A. field orders at Naval Academy Junction.

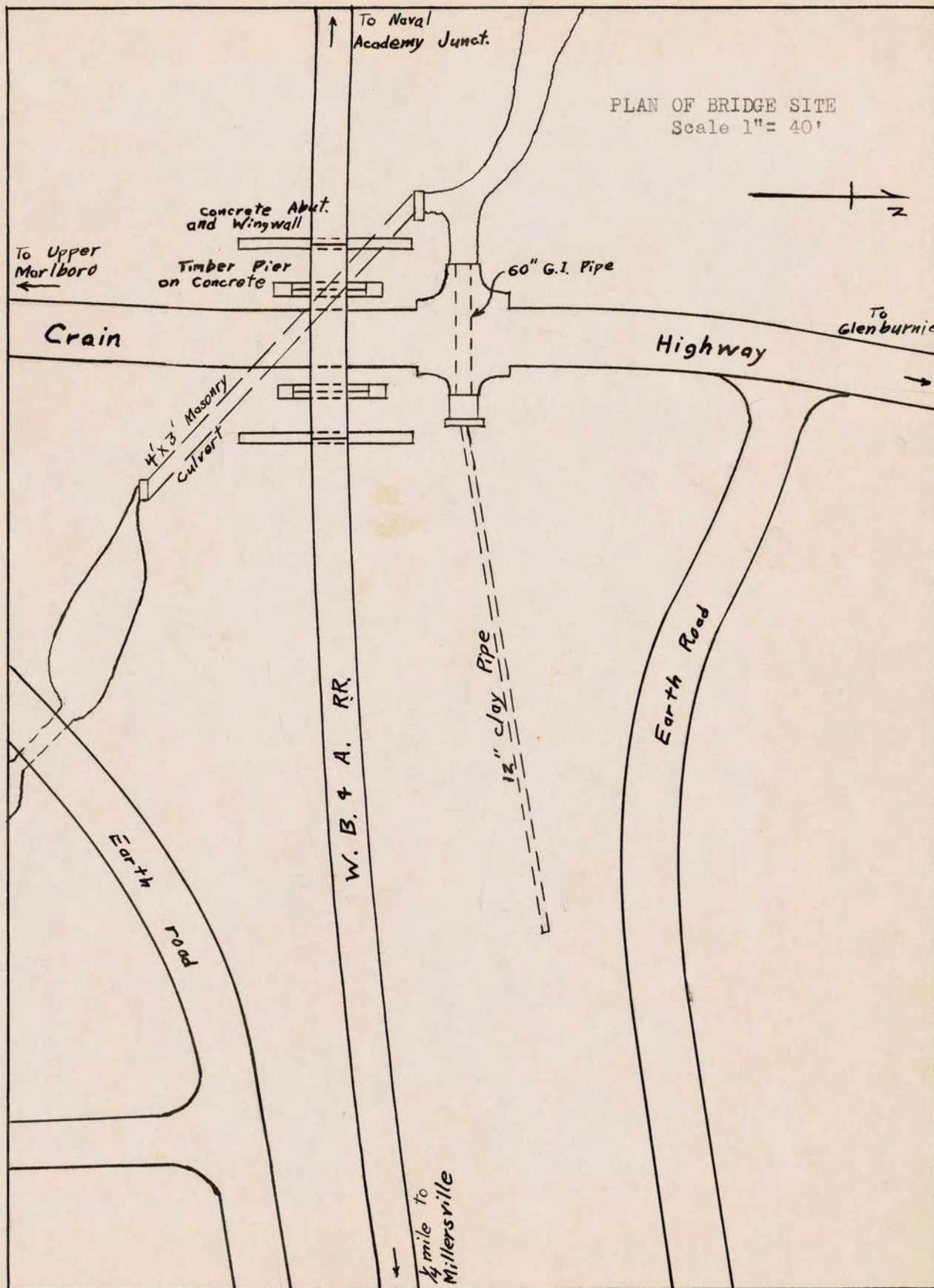
W. B. & A. auditors records at Baltimore.

B. & O. records of the investigation in 1931 at Baltimore.

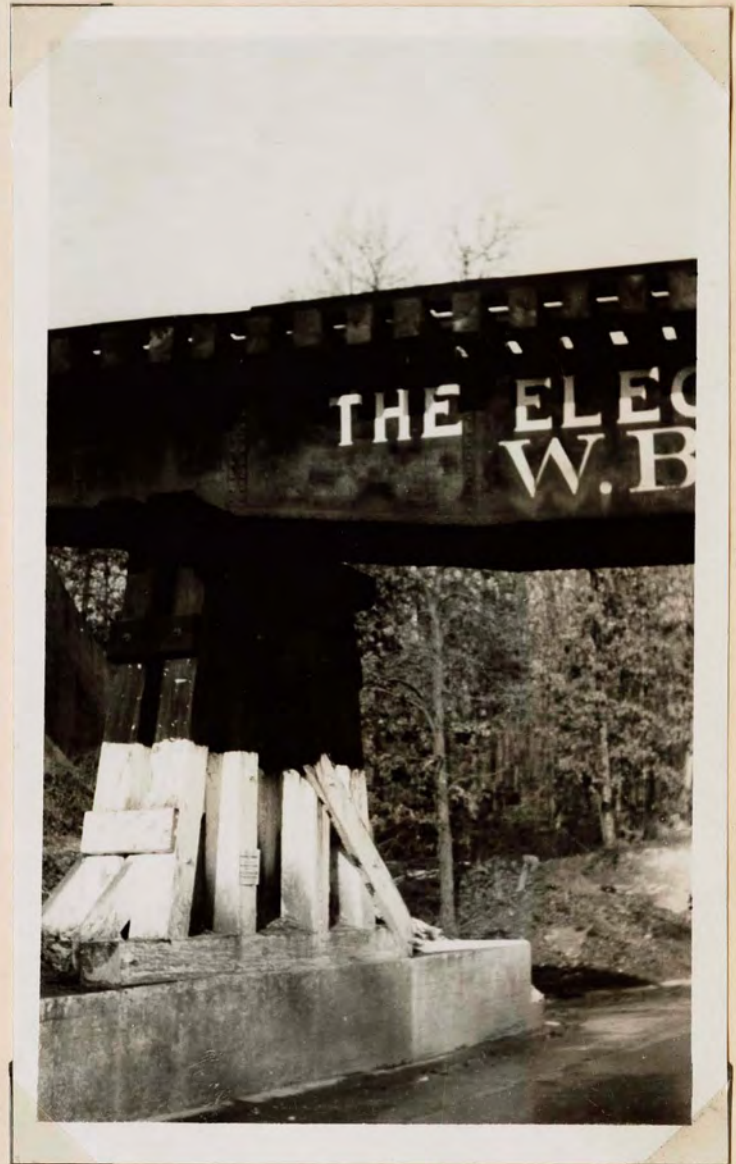
"A Sound Public Utility - W. B. & A. Electric Railway Company - Its History and Financial Conditions"; copy found in the B & O offices in Baltimore.



MAP SHOWING BRIDGE LOCATION
Scale 1 in = 1 mile



GENERAL VIEW OF WEST PIER AND FOUNDATION



ELEVATION VIEW OF WEST PIER

GENERAL VIEW LOOKING WEST TOWARD ACADEMY JUNCTION



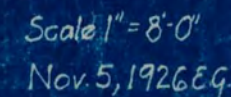
VIEW LOOKING WEST SHOWING CROSSBRACING AND
CONNECTION FOR THE OLD CENTERING

GENERAL VIEW LOOKING NORTH TOWARD GLENBURNIE



VIEW OF THE EAST ABUTMENT & PIER





PHYSICAL CONDITION:

W.B. & A Track

PRINT OBTAINED FROM THE SURVEY OFFICE OF THE STATE ROAD COMMISSION

SHOWING THE PROPOSED LOCATION

Note: This is not the present location.

